age, and then she became stone deaf. This girl had undoubtedly a recollection of music, although she does not now hear any sound. She wrote me a little letter, in which she declared that *what she felt was music*, and that it awakened in her mind a conscious something that recalled what music was The others had no conception of music, but they were able to appreciate the rhythm, and it was interesting to notice how they all, without exception, caught up the rhythm, and bobbed their heads up and down, keeping time with the electrical thrills in their finger-tips.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE —The establishment of a University Lectureship in Experimental Psychology was opposed in the Senate, but it has now been carried by a very large majority.

Thirty-three men and three women have obtained a first-class in the Natural Sciences Tripos, Part I. In Part II. the first-class includes eleven names.

Prof. Allbutt, F.R.S., has been appointed to represent the University at the International Medical Congress to be held at Moscow in August.

The Harkness Scholarship in Geology and Palæontology has been awarded to Mr. R. H. Kitson, of Trinity College.

The Observatory Syndicate report that, Mr. Newall's term of office as Observer having expired, he has generously undertaken to continue to give his services without stipend for another term of five years. They think, however, that the provision of a stipend for the Newall Observer is an urgent claim on the funds of the University. In its present impoverished state the University is much indebted to Mr. Newall for his devoted and efficient aid in the department of physical astronomy. The portion of the catalogue of the *Astronomische Gesellschaft* allotted to Cambridge has now been published, after twenty-five years' work carried out for the most part by Mr. A. Graham. It refers to the zone 25° to 30°, and contains the places of 14,464 stars, obtained from about 47,570 observations. A new photographic telescope is being made for the observatory by Sir Howard Grubb, and the building for its accommodation will be taken in hand this summer.

The Special Board for Physics and Chemistry have, as was anticipated, withdrawn their proposals that the laboratory note-books of candidates for the first part of the National Sciences Tripos should be submitted to the examiners. They adhere to the proposal, in a modified form, as regards the second part of the examination. It is, however, provided that no marks shall be assigned for the note-books, the inspection of which is intended simply to give some guidance to the examiners in estimating the value of the practical part of the examination.

The first dissertations offered by advanced (post-graduate) students as candidates for the B.A. degree have been submitted and approved. Mr. J. S. E. Townsend and Mr. E. Rutherford have each offered memoirs on electrical subjects which have been honoured by publication in the *Phil. Trans.* of the Royal Society, and the Degree Committee record their opinion that the work submitted "is of distinction as a record of original research." These gentlemen have accordingly received the University Certificate of Research, and the degree of Bachelor of Arts, under the new regulations for graduates of other Universities.

The Hutchinson Studentship has been awarded to Mr. V. H. Blackman, of St. John's College, for botanical researches on Algæ. The Hockin Prize for Electricity has been awarded to Mr. W. A. D. Rudge, of the same college, a student in his first year.

THE University of Dublin has conferred the honorary degree of Doctor of Science upon Dr. Wilhelm His, Professor of Anatomy in Leipzig University, and Prof. Ramsay.

THE will of the late Mr. J. H. R. Molson has been admitted to probate at Montreal. It assigns 100,000 dollars to McGill University, 30,000 dollars to the Frazer Institute, and 10,000 dollars to Bishop's College School at Lennoxville.

ON Thursday last a farewell address was presented to Prof. Sollas, F.R.S., by past and present students of geology in Trinity College, Dublin. Prof. Sollas is leaving Dublin for Oxford, where he succeeds the late Prof. Green as professor of geology.

ENDOWMENTS recently received by Rutgers College increase the fund nearly 50,000 dollars, and include 5000 dollars from the Vice-President of the United States; 10,000 from Mrs. Winants, of Brooklyn; 5000 each from Mr. Frederick Frelinghuysen, of Newark, and Mr. Samuel Sloan and Mr. Richard Schlett, of New York, with the promise of 10,000 more from the latter; and 3234 from the Alumni Association.

IN order to obtain an accurate conception of the growth of Harvard University, Prof. C. S. Minot has compiled a table showing the gifts of money to Harvard College from 1868 to 1896, and he makes it the subject of a contribution to the Harvard *Graduate's Magazine* for June. It appears from this article that Harvard University has received annually during the past twenty-eight years in round numbers 330,000 dollars. The educational efficiency of the University has increased even faster than its endowment. It is held that seven scientific departments, in which the Medical, Dental, and Veterinary Schools have a common interest, need immediate endowment. The departments are: (1) anatomy (human and comparative); (2) physiology; (3) histology and embryology; (4) pathology; (5) bacteriology; (6) pharmacology; (7) hygiene. Each of the seven departments needs to be organised on the minimum basis of 300,000 dollars, making in all an endowment of 2,100,000 dollars. If the gifts continue as heretofore, six years would suffice to furnish the required amount. It is suggested that the development of the seven departments mentioned would be facilitated by the consolidation of the Medical, Dental, and Veterinary Schools under a single Faculty.

THE following are among recent appointments:—Mr. J. R. Campbell, of the Glasgow Technical College, to be lecturer in agriculture at the Harris Institute, Preston; Prof. W. T. Engelmann, of Utrecht, to succeed the late Prof. Du Bois Reymond in the chair of physiology in the University of Berlin; Dr. W. B. Pillsbury to be instructor in psychology in the University of Michigan; Dr. C. E. Seashore to be assistant in psychology in the University of Iowa; Mr. S. I. Franz to be assistant in psychology in Columbia University; Prof. William S. Franklin to be professor of physics and electrical engineering at Lehigh University; Dr. John Marshall to be professor of chemistry in the medical department of the University of Pennsylvania; Miss Bertha Stoneman to be professor of botany in the Huguenot College for Women in Cape Colony; Prof. J. L. Prevost to be professor of physiology in the University of Geneva; Dr. P. Francotte to be professor of embryology and Dr. P. Stroobant professor of astronomy in the University of Brussels; Dr. J. J. Zumstein to be professor of anatomy in the University of Marburg; Dr. Fuchs, privat-docent in palæontology and director of the geological section of the Natural History Museum at Munich, to be assistant professor; Dr. H. Baum, prosector and privat-docent in osteology at the Dresden Technical High School, to be professor; Dr. W. Ule, privat-docent in geography at Halle, to be professor; Dr. J. J. Ptaschicky to be professor of geometry at St. Petersburg; Dr. A. O. Kihlman to be assistant professor of botany at Helsingfors; Dr. Heim to be assistant professor of hygiene at Erlangen; Dr. Alex. Bittner to be chief geologist of the K. K. geologischen Reichsanstalt at Vienna; also, at the same institution, G. Geyer to be geologist, G. v. Bukowski and August Rosiwal to be adjunkten, and Dr. J. Dreger, F. Eichleiter, Dr. F. v. Kerner, and Dr. J. J. Jahn to be assistants.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, June 25.—Mr. Shelford Bidwell, President, in the chair.—A paper by Mr. Sutherland, on a new theory of the earth's magnetism, was taken as read.—Dr. Kuenen described some experiments on critical phenomena, made in continuation of a research on the condensation and critical phenomena of mixtures of ethane and nitrous oxide, the results of which were published last year. The author now investigates mixtures of ethane and acetylene, and mixtures of ethane and carbonic acid, and finds for them similar properties to those of the mixtures of ethane and nitrous oxide. The first part of the paper refers to the preparation of ethane, and the effect of impurities on its vapour-pressure, and critical constants.

Ethane from ethyl iodide is not very pure, it has generally several per cent. of an admixture of a substance of higher critical temperature and higher density than ethane; this substance is probably butane. Ethane from sodic acetate, by electrolysis, is nearly pure; the method of preparation is described by the author. The pressure and corresponding volumes during condensation are given for this substance at various temperatures. In the former paper, above referred to, instances are mentioned of mixtures having critical temperatures *below* those of the component substances. The only instance of critical temperatures *above* those of the components, seem to be those relating to mixtures of carbonic acid and acetylene. According to an experiment of Dewar's, however, a mixture of $\frac{1}{2}CO_2$ and $\frac{1}{2}C_2H_2$ has a critical temperature of 41° C., those for carbonic acid and acetylene being 31° and 37° respectively. The present investigation contradicts this result. Dewar may not have taken sufficient precaution in avoiding errors of retardation. Mixtures of carbonic acid and acetylene have critical temperatures between those of the component pure gases. The diagram connecting temperature and volume shows that the plait-point curve is a line with small curvature; the border-curve is relatively narrow. An instance of a critical temperature above those of the components, for this mixture, has not yet been proved. Theory indicates that this phenomenon probably occurs for mixtures having a minimum vapour-pressure at low temperature. Critical temperatures below those of components, seem to occur for mixtures having a maximum vapour-pressure; as for nitrous oxide and ethane. The law connecting the two phenomena is deduced from van der Waal's theory. As a further application of this theory, it is shown that in consequence of certain coincidences between the real border-curve and the hypothethical border-curve, the critical point of the maximum mixture may be determined in exactly the same way as for a single substance. A remark is added with regard to the condensation of such substances as exhibit changes of molecular systems. If an association takes place of molecules to more complicated systems, van der Waal's formula does not apply. Dr. S. P. Thompson asked whether diagrams characteristic of cyanogen had been obtained. Its remarkable polymerism suggested an interesting case for critical phenomena. Dr. Kuenen thought such a substance might be worth investigation.—A paper by Dr. Barton, on the attenuation of electric waves in wires, was taken as read.—Mr. G. F. C. Searle read a paper on the steady motion of an electrified ellipsoid. The first part of the investigation is printed in the *Phil. Trans. Roy. Soc.*; it contains the principles required in the solution of problems with respect to moving electrical charges. The second part, now presented to the Physical Society, deals with the motion of a charged ellipsoid; the treatment is entirely mathematical. When any system of electric charges moves with uniform velocity through the æther, the electro-magnetic field, referred to axes moving forward with the charges, can be completely defined by means of a quantity of which the electric force and the magnetic force are simple functions. Another vector concerned in the problem is the mechanical force experienced by a unit charge moving with the rest of the system. A distribution of electricity on the surface of a charged body such as to give zero distribution at all points inside the surface is an equilibrium distribution. Since the mechanical force vanishes inside the surface, it is shown that on the outside of the surface the mechanical force is perpendicular to the surface, and the above-mentioned function is constant over the surface, and the distribution on an ellipsoid is the same for motion as for rest. When a charged sphere is at rest it produces the same effect as a point-charge at its centre. If the sphere is in motion it produces the same effect as a uniformly-charged line whose length bears to the diameter of the sphere the same ratio as the velocity of the sphere bears to the velocity of light. When the sphere moves with the velocity of light, the line becomes the diameter of the sphere; the same is true for an ellipsoid. At the velocity of light, the charge on any surface is in equilibrium, whatever the distribution. The force between two charges moving with the speed of light, is zero. The lines of electric force for a charged sphere in motion are not radial; they form a series of hyperbolas. The author proceeds to calculate the total energy possessed by an ellipsoid when in motion along its axis of figure. Expressions are given (1) for the energy of a Heaviside ellipsoid; (2) for a sphere; and (3) for a very slender ellipsoid. In all cases the energy becomes infinite when the charges move at the velocity of light. It would seem impossible to make a charged body move at a greater speed than that of light. Prof. Perry said the paper would help to solve many problems connected with the effect of the rotation of the earth upon electrical surface charges. An expression might be found for the mechanical and magnetic forces due to the motion of a charge at any point of the earth's surface. At the equator a point moves at different velocity at midday to its midnight velocity; it may now be possible to determine the magnetic and mechanical effects due to electrical charges at equatorial points. Mr. Blakesley asked whether, in calculating the mutual action of two charged particles, proceeding at the velocity of light, it was assumed that the lines of motion were parallel. Mr. Searle said he had always considered parallel lines of motion; he could not say whether the force would be zero in any other case. The results arrived at in the paper could be applied to problems connected with distributions of terrestrial charges.—The President proposed votes of thanks to the authors; the meeting then adjourned until November.

Chemical Society, June 3.—Prof. Dewar, President, in the chair.—The following papers were read:—On the thermal phenomena attending the change of rotatory power of freshly-prepared solutions of certain carbohydrates; with some remarks on the cause of multirotation, by H. T. Brown and S. Pickering. Freshly prepared solutions of dextrose, lævulose, and milk-sugar contain the sugar as an unstable α-modification, which gradually changes into a stable β-modification; this change is made apparent by a change of specific rotation, and, as the authors show, is accompanied by evolution of heat, the quantity of which has been measured.—On the thermo-chemistry of carbohydrate-hydrolysis: (1) The hydrolysis of starch by vegetable and animal diastase; (2) the hydrolysis of cane-sugar by invertase, by H. T. Brown and S. Pickering. The authors have determined by direct measurement the heat evolved in the hydrolysis of starch by malt-diastase, pancreatic-diastase, Taka-diastase and saliva, and in the hydrolysis of cane-sugar by invertase.—Optical inversion of camphor, by F. S. Kipping and W. J. Pope. It is shown that during the sulphonation of *d*-camphor, part of it is converted into *l*-camphor.—Derivatives of camphoric acid. Part ii. Optically-inactive derivatives, by F. S. Kipping and W. J. Pope.—Racemism and pseudoracemism, by F. S. Kipping and W. J. Pope. The authors show that a number of apparently racemic compounds really consist of intercalations of crystals of the two enantiomorphously related components; the term pseudoracemic is applied to such substances of which several are described in detail.—Note on some new gold salts of the Solanaceous alkaloids, by H. A. D. Jowett. Hyoscine hydrobromide combines with auric chloride and bromide, giving salts of the composition X, HBr, $AuCl_3$ and X, HBr, $AuBr_3$.—Production of camphenol from camphor, by J. E. Marsh and J. A. Gardner. Camphenol, an isomeride of camphor, is obtained by the action of strong sulphuric acid on chlorocamphene, camphene dichloride, and turpentine dihydrochloride.—Preliminary note on the oxidation of fenchene, by J. A. Gardner and G. B. Cockburn. Cis-camphopyric acid is produced on oxidising fenchene with dilute nitric acid.—Apiin and apigenin, by A. G. Perkin. The author produces experimental evidence which renders it probable that apigenin is a hydroxy-derivative of chrysin, the colouring matter of poplar buds.—Rhamnazin, by A. G. Perkin and H. W. Martin.—Experimental verification of van 't Hoff's constant in very dilute solution, by M. Wildermann.—The isomeric dibromoethylenes, by T. Gray. The author has been unsuccessful in his attempts to prepare a stereo-isomeride of ordinary symmetrical dibromoethylene; he considers the latter to be the trans-compound.

Entomological Society, June 2.—Mr. R. Trimen, F.R.S., President, in the chair.—The President referred to the great loss which the Society had sustained by the death of Dr. Fritz Müller, one of its Honorary Fellows, and to his distinguished services in the cause of entomological science, and especially in forwarding the theory of the origin of species.—Dr. Chapman exhibited the larva of *Eriocephala allionella*.—Mr. Jacoby exhibited a fine example of the large Hepialid, *Leto venus*, from Plettenberg Bay, South Africa. The President said that the insect afforded an interesting case of localised distribution, being confined to an area of about fifty by fourteen miles, whereas the larva fed in the wood of *Virgilia capensis*, a common and widely-distributed leguminous tree. The insect was very conspicuous, and could not have been overlooked in other localities.—Mr. Burr showed a pair of gynandromorphous earwigs, *Chelisoches* *morio*, Fabr., from Java, with ordinary males and females for comparison. In both specimens the right branch of the forceps was of the male, and the left branch of the female form.—The Hon. Walter Rothschild exhibited a series of specimens of *Eudæmonia brachyura*, Drury, and *E. argiphontes*, Kirby, to show the differences between these two West African Saturniid moths. The distinctness of the latter species had been doubted, as until recently it was only known by the unique examples in the Dublin Museum, and the three published figures of these were materially different from each other. A comparison of the series exhibited showed the two species to be abundantly distinct.—Mr. Kirkaldy exhibited fifty specimens of *Notonecta glauca*, Linn., to show the extreme range in size and colour of this widely-distributed species.—The discussion on mimicry and homœochromatism in butterflies was then resumed by Dr. Dixey, who replied to the comments of Prof. Poulton and Mr. Blandford on his paper. He did not regard the phenomenon of reciprocal convergence as necessarily a demonstrable feature in Müllerian mimicry; it was merely potential. With respect to mimetic Pierinæ, he did not consider that they were invariably protected, but that, in certain cases, they were shown to be so by the indications of convergence exhibited by the models. Mr. Elwes thought, from his personal experience as a collector, that there was too much assumption about both the Batesian and Müllerian theories. In many supposed cases he doubted whether the so-called models were protected by taste or smell. He had previously referred to the extraordinary superficial resemblance between two Pieridæ found in the high Andes of Bolivia, and two others found at similar elevations in Ladak, and was inclined to think that similar conditions of environment produced similar effects. Mr. J. J. Walker, Sir George Hampson, and Colonel Yerbury gave evidence, from personal experience in the Tropics, as to the extreme rarity of butterfly-destruction by birds. The President admitted its rarity in Africa, but stated that he had seen birds, especially the Drongo shrike, chasing butterflies. Mr. Blandford called attention to a recent paper by M. Piepers, who, as the result of twenty-eight years' observation in the Malay region, had seen four instances only of butterflies, two of which belonged to the "protected" genus *Euplœa*, being attacked by birds, and had been driven to the conclusion that the phenomena of mimicry had nothing to do with natural selection.—Papers were communicated by the Rev. F. D. Morice, on new or little-known Sphegidæ from Egypt, and by Prof. J. R. Grote, on changes in the structure of the wing of butterflies.

Geological Society, June 9.—Dr. Henry Hicks, F.R.S., President, in the chair.—The Cretaceous strata of County Antrim, by Dr. W. Fraser Hume. The paper, which dealt with the Irish Cretaceous strata, was divided into four parts, viz.: I. A detailed account of the principal subdivisions, their local distribution, and characteristic fossils. The area occupied by these rocks is separated into five divisions, each marked by special lithological and palæontological features. The main lithological features are displayed in sections between Lisburn and Belfast; they are (1) glauconitic sands (a blue-green rock rich in glauconite); (2) glauconitic marls; (3) yellow sandstones (a light calcareous sandstone); (4) chloritic sands and sandstones of the *Exogyra columba*-zone (yellow-green sands and sandstones); and (5) white limestone. II. Chemical and micromineralogical examination of the lithological types. The glauconitic sands are characterised by the abundance of glauconite (23 per cent. $CaCO_3$), showing evidence of having been formed in the interior of foraminiferal shells; the glauconitic marls by an abundance of spheres and rods of pyrites; the yellow sandstones by a series of heavy minerals, notably rutile, zircon, tourmaline, kyanite, and perfectly-formed crystals of garnet; the *Inoceramus*-zone contains delicate glauconitic mesh-works of hexactinellid sponges and silicified portions of *Inoceramus* and brachiopoda, besides an abundant series of heavy minerals: in the chloritic chalk above the glauconitic sponge-casts become very abundant, associated with delicate casts of foraminifera; the white limestone itself has scarcely any residue. The analyses show that the percentage of carbonate of lime increases steadily from base to summit, the glauconitic marls alone being an exception. III. This section dealt with the stratigraphical conclusions. IV. General questions.—An account of the Portraine inlier, by C. I. Gardiner and S. H. Reynolds.—Some igneous rocks in North Pembrokeshire, by J. Parkinson.

Zoological Society, June 15.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.—Dr. Arthur Keith exhibited a series of lantern-slides showing the arrangement of the hair and some other points of interest in the Orang-Outang (*Simia satyrus*) that had lately died in the Society's Gardens.—Mr. Oldfield Thomas read an account of the mammals obtained by Mr. John Whitehead during the last three years in the Philippine Islands. During this expedition the peculiar mammal-fauna of the mountains of northern Luzon had been discovered, and Mr. Thomas had already described no less than five new genera and eight new species belonging to it. The paper read contained a detailed account of the whole of Mr. Whitehead's collection.—A communication was read from Prof. T. W. Bridge, on the presence of ribs in *Polyodon* (*Spatularia*) *folium*.—Mr. R. I. Pocock read a paper on the spiders of the suborder *Mygalomorphæ* from the Ethiopian region contained in the collection of the British Museum. Many new genera and species were described, the most interesting being the new genus *Cyclotrematus*, containing two new species collected in Mashonaland by Mr. J. ffolliott Darling, *Stasniopus oculatus*, sp. nov., from Bloemfontein, and *Moggridgea whytei*, sp. nov., obtained by Mr. A. Whyte on the Nyika Plateau. The discovery of new stridulating organs, consisting of modified setæ, lying between the mandible and the maxilla in *Harpactina*, was also alluded to.—A communication was read from Miss Emily M. Sharpe on the butterflies collected in the neigbourhood of Suakim by Mr. Alfred J. Cholmley. Thirty species were enumerated, and the localities where the specimens were collected and the dates of their capture were recorded.—A communication was read from Mr. Walter E. Collinge, describing two new slugs of the genus *Parmarion* from Borneo, viz. *P. everetti* and *P. intermedium*.—A communication was read from Dr. Alphonse Dubois, containing notes on certain specimens of birds in the Brussels Museum, and describing a supposed new species of woodpecker from Borneo, proposed to be called *Tiga borneonensis*.—A communication from Mr. D. J. Scourfield contained some preliminary notes and a report on the Protozoa, Tardigrada, Acarina, and Entomostraca collected by Dr. J. W. Gregory during his expedition to Spitzbergen in 1896.—A communication from Mr. David Bryce contained a report on the Rotifera collected by Dr. Gregory's expedition in Spitzbergen.—Mr. G. A. Boulenger, F.R.S., gave a list of the reptiles and batrachians collected in Northern Nyasaland by Mr. Alex. Whyte, and presented to the British Museum by Sir Harry Johnston, K.C.B. Thirty-six species of reptiles and fifteen species of batrachians were enumerated, of which the following were described as new:—*Lygosoma johnstoni*, *Glypholycus whytii*, *Anthroleptis whytii* and *Hylambates johnstoni*.—Dr. Fowler communicated a paper on the later development of *Arachnactis albida* (M. Sars) and on *A. boweni*, sp. nov., being the third instalment of the "Contributions to our Knowledge of the Plankton of the Faeroe Channel."

Royal Meteorological Society, June 16.—Mr. E. Mawley, President, in the chair.—A paper, by Mr. R. C. Mossman, on the non-instrumental meteorology of London, 1713–1896, was read by the Secretary. The author has gone through the principal meteorological registers and weather records kept in the metropolis, and in this paper discusses for a period of 167 years the notices of thunderstorms, lightning without thunder, fog, snow, hail and gales. The average number of thunderstorms is 9·7 per annum, the maximum occurring in July, and the minimum in February. The average number of fogs is 24·4, and of "dense" fogs 5·8 per annum. The decadal means show that there has been a steady and uninterrupted increase of fog since 1841. The average number of days with snow is 13·6 per annum. The snowiest winter was that of 1887–8, with forty-three days, while in the winter of 1862–3 there is not a single instance of a snowfall. The mean date of first snowfall is November 9, and of last snowfall March 30. Hail is essentially a spring phenomenon, reaching a maximum in March and April; the minimum is in July and August. The average number of days with hail is 5·9 per annum.—Mr. C. Harding gave an account of the hailstorm which occurred in the south-west of London on April 27. This accompanied a thunderstorm, in which the lightning was very vivid. The hail lasted only about twenty minutes, from 6.30 to 6.50 p.m., and in that short space of time the melted hail and rain amounted to about an inch of water. The districts affected by the hail were Tooting, Balham, Streatham, Tulse Hill, and Brixton. The ground was quite white with the hailstones, which in some places remained unmelted the whole of the next day. Much damage was done to fruit-trees and shrubs.

PARIS.

Academy of Sciences, June 21.—M. A. Chatin in the chair.—On the Abelian functions, by M. H. Poincaré.—Expression of the small transverse components of velocity in the gradually varied outflow of liquids, by M. Boussinesq.—Note on the seventh volume of the "Annales de l'observatoire de Bordeaux," by M. Lœwy.—Examination of some spectra, by M. Lecoq de Boisbaudran. A discussion of some points raised by MM. Eder and Valenta on the spectrum of gold.—Note by M. Pomel accompanying the presentation of his work on the "Mammifères quaternaires fossiles algériens, monographie des Porcins."—M. Hatt was nominated a member in the Section of Geography and Navigation, in the place of the late M. d'Abbadie.—On the universal deluge, by M. F. E. Paumier.—On the movement of the perihelia of Mercury and Mars, and of the node of Venus, by M. Simonin.—On the surfaces which can, in several different movements, develop a family of Lamé, by M. Eugène Cosserat.—Observations by M. Darboux on the preceding communication.—On a class of hyperabelian functions, by M. H. Bourget.—On certain equations analogous to differential equations, by M. C. Bourlet.—Observations on the preceding communication, by M. Appell.—On a class of ds^2 of three variables, by M. Levi-Civita.—Application of photography to the measurement of indices of refraction, by MM. Auguste and Louis Lumière. The plate, the refractive index of which is to be measured, is coated very thinly with the sensitive emulsion. It is then faintly illuminated by rays from a point (a minute hole in a sheet of metal). Under these circumstances a halo is produced, arising from reflexion at the back of the plate, the edges of which are quite sharp, and whose diameter determines the refractive index. To apply this method to the measurement of the refractive index of liquids, the back of the plate is wetted with the liquid, and backed with a piece of black velvet soaked in the same. Data are given for water and glycerine.—On a new self-registering apparatus for submarine cables, by M. Ader. The improvements consist of devices for reducing the inertia of the moving parts. The wire carrying the cable current forms part of a minute dynamometer, placed in a powerful magnetic field formed by a permanent magnet. The oscillations are recorded photographically; a practical trial over the Brest-St. Pierre and Marseilles-Algiers cables showed that the number of signals transmitted per minute was from 1·5 to 2·7 times that of the maximum obtainable by the Kelvin recorder.—On a new electrolytic condenser of large capacity and on an electrolytic current rectifier, by M. Ch. Pollak. By passing firstly an alternating current and then a continuous current between aluminium electrodes in an alkaline solution, the plates become coated with an extremely thin crystalline deposit of oxide, which is practically non-conducting. A condenser is thus obtained in which the oxide film acts as the dielectric, and the extreme thinness of this film is the cause of its very high capacity.—Double and triple lines in spectra produced under the influence of an external magnetic field, by M. Zeeman.—On the sulpho-antimonites of potassium, by M. Pouget.—On the fluidity of fused nickel, by M. Jules Garnier.—Combinations of tellurium iodide and bromide with the corresponding hydracids, by M. R. Metzner.—The electrolytic analysis of brass and bronze, by M. Hollard.—The reaction between formaldehyde and potash, by M. Delépine. A thermo-chemical study.—Destruction of organic matter in toxicological researches, by M. A. Villiers. The use of manganese salts with a mixture of hydrochloric and nitric acids is recommended.—On caffotannic acid, by MM. P. Cazeneuve and Haddon.—Coleopterine, a red pigment in the wing shells of some Coleoptera, by M. A. B. Griffiths.—On the decolorisation of wine; new interpretation based upon the function of iron salts, by M. H. Lagatu.—On the subrenal capsules, the renal organs, and lymphoidal tissue of lophobranchial fishes, by M. E. Huot.—On a new Copepod, by M. Emile Brumpt. The new species is found as a parasite of *Polycirrus aurontiacus* (Grube), and is named *Saccopsis Alleni.*—Action of mineral salts upon the development and structure of some graminæ, by M. Ch. Dassonville. The graminaceæ studied, when they were cultivated in pure water, showed a more feeble development in all the tissues, but a much greater lignification.—On the propagation of *Pseudocommis vitis* (Debray), by M. E. Roze.—On the discovery of new strata containing fossils of mammals in the Island of Corsica, by M. Charles Depéret.—On some localisations of morphine in the organism, by MM. A. Antheaume and A. Mouneyrat.—New experiments on nerve irritation by electric rays, by M. B. Danilewsky.—The diurnal oscillatory movement of the atmosphere, by M. Dechevrens.—On the tornado of June 18, at Asnières, and the storm phenomena observed on the same day, by M. Joseph Jaubert.—On the tornado of June 18, by M. Léon Teisserenc de Bort.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—The Yew Trees of Great Britain and Ireland: Dr. J. Lowe (Macmillan).—Elektrische Ströme: Prof. E. Cohn (Leipzig, Hirzel).—The New Africa: Dr. A. Schulz and A. Hammar (Heinemann).—The Life-Histories of the British Marine Food-Fishes: Prof. McIntosh and A. T. Masterman (C. J. Clay).—Lectures on the Action of Medicines: Dr. T. Lauder Brunton (Macmillan)—Botanische Wanderungen in Brasilien: Dr. W. Detmer (Leipzig, Veit).—Ostwald's Klassiker der Exakten Wissenschaften, Nr. 86, 87 (Leipzig, Engelmann).—Monthly Current Charts of the Atlantic Ocean (London).—Die Mechanik in Ihrer Enwickelung: Dr. E. Mach (Leipzig, Brockhaus).—L'Année Biologique, Première Année 1895 (Paris, Schleicher).—Macmillan's Geography Readers, Book 4 (Macmillan).—Thirty Years of Teaching: Prof. L. C. Miall (Macmillan).

PAMPHLETS.—Die Gesetze der Rotationselemente der Himmelskörper: C. A. Lilje (Stockholm).—The Extinction of War, Poverty and Infectious Diseases (Truelove).—The Science of Speech: A. M. Bell (Washington).

SERIALS.—Engineering Magazine, June (Tucker).—Botanische Jahrbücher, Dreiundzwanzigster Band, 4 Heft (Leipzig, Engelmann).—Journal of the Institution of Electrical Engineers, June (Spon).—Proceedings of the Academy of Natural Sciences of Philadelphia, 1897, Part 1 (Philadelphia).—Sitzungsberichte der K. B. Gesellschaft der Wissenschaften, Math. Naturw. Classe, 1896, i. and ii. (Prag)—Twentieth Annual Report of the Connecticut Agricultural Exploration Station (New Haven)—Archives of Skiagraphy, No. 4 (Rebman).—Good Words, July (Isbister).—Sunday Magazine, July (Isbister).—Longman's Magazine, July (Longmans).—Humanitarian, July (Hutchinson).—Aus dem Archiv der Deutschen Seewarte, xix. Jahrgang, 1896 (Hamburg).—Séances de la Société Française de Physique, 1895, 4^e Fasc. (Paris).—Transactions of the Leicester Literary and Philosophical Society, Vol. iv. Part 8 (Leicester).—Manchester Microscopical Society, Transactions and Annual Report, 1896 (Manchester).—Reliquary and Illustrated Archæologist, July (Bemrose).—Contemporary Review, July (Isbister).

CONTENTS.

PAGE

Lakes Rudolf and Stefanie. By **J. W. G.** 193
Exercises in Physics. By **A. P. C.** 194
Cosmic Ethics. By **H. W. B.** 195

Our Book Shelf:—

Bennett: "The Flora of the Alps" 195
Bryan: "First Stage Mechanics of Fluids" 196
Sigsbee: "Illustrative Cloud Forms" 196
Lee: "Among British Birds in their Nesting Haunts, illustrated by the Camera" 196
Day: "The Indigenous Drugs of India" 196

Letters to the Editor:—

The Storm in Essex on June 24.—**Sheffield Neave.** 196
On Mimicry.—**Walter F. H. Blandford** 197
A Bacterium living in Strong Spirit.—**V. H. Veley, F.R.S., and Lilian J. Veley** 197
A Well known Text-Book of Chemistry.—**Prof. William A. Tilden, F.R.S.** 197
The Gravitation Constant.—**Dr. Charles Braun** 198
The American Excavations in Southern Babylonia 198
The Fresh-water Fauna of Lake Tanganyika. (*Illustrated.*) By **J. E. S. Moore** 198
The Lawrence Medal. (*Illustrated.*) 200
Julius Sachs. By **Francis Darwin, F.R.S.** 201
Professor R. Fresenius. By **T. E.** 202
Notes 203

Our Astronomical Column:—

Personal Equations in Transit Observations 206
Paris Observatory Report 206
Belgian Time-Reckoning 206
A New Classification of Stellar Spectra. By **A. Fowler** 206
The American Association for the Advancement of Science 208
The Analysis of Phonograph Records. (*Illustrated.*) By **Dr. John G. McKendrick, F.R.S.** 209
University and Educational Intelligence 213
Societies and Academies 213
Books, Pamphlets, and Serials Received 216